REMARKS

Introduction

Claims 11 through 20 are currently pending and rejected in this application. Claims 11, 18, 19 and 20 have been amended. In view of the explanations set forth below, Applicants submit that pending claims 11 through 20 are in condition for allowance.

Claim Rejection under 35 U.S.C. §101

Claim 18 is rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. In order to expedite prosecution, claim 18 has been amended in accordance with the Examiner's suggestion, i.e., amended claim 18 now recites "the method is carried out via a computer program stored on a memory element executable on one of a computing unit and a control unit corresponding to a processing unit." For at least these reasons, Applicants submit that the amended claim 18 is directed to a statutory subject matter under 35 U.S.C. § 101.

Claim Rejection under 35 U.S.C. §112

Claims 11 and 20 were rejected under 35 U.S.C. § 112 as being indefinite. To the extent the Examiner contends that forming "the first signature on the transmitted data and the inverted data to be transmitted . . . will not result in useful information (signature) . . . [because] any data and its invert (complement) would produce all logic one's," this contention assumes **a particular logical operation in which the data and its invert produce a logic one**, but there is no such limitation recited in claims 11 and 20. In this regard, amended claims 11 and 20 clearly recite "**forming**, according to a specifiable signature formation method, **a first signature as a function of both the data to be transmitted and the inverted data**," i.e., the claimed limitation only requires that the first signature is formed "as a function of **both** the data to be transmitted and the inverted data," but there is no limitation in claims 11 and 20 regarding the particular logical operation applied to the data to be transmitted and the inverted data. If the data to be transmitted and the inverted data were linked together by means of a disjunction (OR-operation), the result would be all logic ones. However, forming the first signature **as a function of both the data to be transmitted and the inverted data** does not necessarily mean that the data to be transmitted and the inverted data are combined by a disjunction; instead, as disclosed in the

present specification, the first signature is formed sequentially as a function of the data to be transmitted and then of the inverted data. The method for forming the first signature is described in detail on page 11, line 11 - page 12, line 23 of the Substitute Specification. In particular, it is mentioned on page 11, line 17 – page 12, line 4, that the first signature is formed as a function of the data to be transmitted. Further, it is described on page 12, lines 5-10 that the forming of the first signature is then continued as a function of the inverted data. It can be taken from page 12, lines 19-20 that the first signature formed as a function of the data to be transmitted and of the inverted data is stored in the signature register Sx at the end of the process of forming the first signature. According to the present invention, the first signature is formed not only as a function of the data to be transmitted, but rather as a function of a data stream having twice the length of the data to be transmitted, i.e., the first part of the data stream includes the data to be transmitted, and the second part of the data stream does not simply contain a copy of the data to be transmitted but rather contains the inverted data. By forming the first signature as a function of the longer data stream, the probability of error masking can be significantly reduced.

In addition to the above, to the extent the Examiner contends at the bottom of p. 3 of the Office Action that it is "not distinct whether the '**first signature**' is the one formed on 'the transmitted data' or 'the inverted data to be transmitted,'" Applicants submit that amended claims 11 and 20 do not present any possible ambiguity with respect to "the first signature": amended claims 11 and 20 clearly recite that a single "first signature" is formed "**as a function of both the data to be transmitted and the inverted data**," and there is no reasonable basis to interpret the claimed limitation to require two distinct "first signatures" which are separately formed based on the "data to be transmitted" or "the inverted data."

In addition to the above, the Examiner has raised the same issues with respect to the "second signature" recited in claims 11 and 20. In this regard, Applicants note that amended claims 11 and 20 recite "forming a second signature in the receiver according to the specifiable signature formation method as a function of both the transmitted data and the inverted transmitted data." For the reasons explained above in connection with the recitation of "the first signature," Applicants submit that the "second signature" recitation in amended claims 11 and 20 does not raise any ambiguity.

It is therefore respectfully requested that the indefiniteness rejections of claims 11 and 20 be withdrawn.

Claim Rejection under 35 U.S.C. §102(b)

Claims 11 through 20 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,274,646 to Brey et al. ("Brey"). Applicants respectfully submit that the rejection should be withdrawn for at least the following reasons.

As regards the anticipation rejections of the claims, to reject a claim under 35 U.S.C. § 102(b), the Office must demonstrate that each and every claim feature is identically described or contained in a single prior art reference. (See *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991)). Still further, not only must each of the claim features be identically described, an anticipatory reference must also enable a person having ordinary skill in the art to practice the claimed invention, namely the claimed subject matter of the claims, as discussed herein. (*See Akzo, N.V. v. U.S.I.T.C.*, 1 U.S.P.Q.2d 1241, 1245 (Fed. Cir. 1986)). As further regards the anticipation rejections, to the extent that the Office Action may be relying on the inherency doctrine, it is respectfully submitted that to rely on inherency, the Office must provide a "basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristics *necessarily* flow from the teachings of the applied art." (*See* M.P.E.P. § 2112; emphasis in original; and *see Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int'f. 1990)). Thus, the M.P.E.P. and the case law make clear that simply because a certain result or characteristic may occur in the prior art does not establish the inherency of that result or characteristic.

Amended claims 11 and 20 recite, in relevant parts, "inverting the data to be transmitted; **forming, according to a specifiable signature formation method, a first signature as a function of both the data to be transmitted and the inverted data**; transmitting the first signature together with the data to a receiver; inverting the transmitted data at the receiver; **forming a second signature in the receiver according to the specifiable signature formation method as a function of both the transmitted data and the inverted transmitted data**; and comparing the first signature with the second signature."

According to the present invention, the first signature is formed as a function of both the data to be transmitted and the inverted data. The data is transmitted to the receiver, where the received data is inverted, and **the second signature is formed as a function of the received data and the inverted received data**. Hence, the first signature and the second signature are each formed as a function of a data stream including not only the data to be transmitted or the received data, respectively, but also an inversion of the data to be transmitted or of the received data, respectively. Forming the first and the second signatures as a function of a much longer data stream significantly reduces the probability of error masking, which concept will be explained in detail below.

In the prior art, even if the correctness of a data transmission is monitored by using first and second signatures, it may occur that even though the data has been incorrectly transmitted, an error-free second signature is formed. This means that the data to be transmitted do not comply with the transmitted data, but nonetheless the first signature that was formed as a function of the data to be transmitted complies with the second signature that was formed as a function of the transmitted data. This is known as "error masking" (see, e.g., page 2, line 31 – page 3, line 3 of the Substitute Specification). The principle idea of the present invention is to reduce the probability of the error masking, i.e., enhance the reliability of the detection of errors in the data transmission; the present invention does not refer to any kind of correction of the detected errors.

In contrast to the present claimed invention, Brey refers to a method for handling storage errors, i.e., for correcting **erroneous data stored in a memory unit after detection of the errors**, but Brey does not refer to the detection of **data transmission errors**. The only discussions in Brey that may be related to the detection of data transmission errors are the statements that "the C/R complemented/recomplemented] method is initiated only after the ECC in a data unit finds an excessive error" (see col. 1, lines 38 and 39 of Brey), and "circuit 13 error checks each DU+ECC group and passes it to its requestor, whether the ECC logic found it error-free or not" (see col. 6, lines 50 – 52 of Brey). These passages of Brey clearly do not teach or suggest the claimed feature of forming a second signature as a function of the transmitted data and then comparing the first signature with the second signature. Further, it can be taken from Figure 8, step number 3 that the ECC logic circuit 13

detects only so-called excessive errors (see col. 1, lines 7 -10; col. 1, lines 34 – 35; and col. 1, lines 38 and 39 of Brey), i.e., the ECC logic circuit 13 detects only so-called hard errors (see col. 1, lines 25 – 28 of Brey). In contrast thereto, the present invention is aimed at avoiding that so-called soft errors mentioned in Brey (see col. 1, lines 28 – 31 of Brey) which produce an error masking, thereby impeding the detection of data transmission errors although the data was not transmitted error-free.

In addition to the above, the Examiner states that Brey also discloses the feature of **inverting the data to be transmitted** and inverting the transmitted data, respectively. However, in Brey the inversion of data is only performed for the purpose of error correction, that is during the execution of the C/R function. It can be seen from col. 6, lines 57 – 59 of Brey that **the data has already been transmitted** to the requestor regardless of whether the data is error-free or not (see col. 6, lines 54 – 56 of Brey). The requestor can decide whether it wants an error correction to be performed on the received data or not (see col. 6, lines 59 – 64 of Brey). Therefore, Brey clearly does not disclose the **inversion of data prior to data transmission** and with the aim to enhance reliability of the detection of data transmission errors.

Furthermore, Brey does not disclose the step of forming the second signature according to the specifiable signature formation method as a function of the inverted transmitted data and the received data. Regarding this claimed feature, the Examiner refers to the table in col. 8 of Brey ("second fetch," wherein the DU is inverted). However, the "second fetch" is only executed **if the data transmitted to the requestor has an error and if the requestor makes a re-fetch request** to the transmitter (the main storage 11) (see col. 7, lines 43 – 46 of Brey). Again, the purpose of the re-fetch request is to attempt a correction of the error in the transmitted data. In addition, the process of inverting the transmitted data is not executed at the receiver (the requestor) but rather before, i.e., somewhere in between the transmitter (the main storage 11) and the requestor, that is in the inverter (12). This clearly shows that the method described in Brey can not be used for determining errors in data transmission, but only for determining errors in the data stored in the main storage (11).

Finally, Brey does not disclose the step of comparing the first signature (formed in the transmitter and transmitted to the receiver together with the transmitted data) and the second signature (formed in the receiver). Step 23 in Figure 9 of Brey merely discloses the step of comparing the content of outpointers 1, 2 and 3. However, the comparison of outpointers has nothing to do with the comparison of first and second signatures according to claims 11 and 20. In addition, step 22 of Figure 9 of Brey discloses the step of parity checking the content of status buffers 1 and 2, which has nothing to do with the comparison of first and second signatures according to claims 11 and 20. Rather, the status buffers 1 and 2 merely contain S and P bits (see step 14 in Figure 9 and col. 9, lines 30 – 34 of Brey).

For at least the foregoing reasons, Applicants respectfully submit that Brey fails to describe or suggest the features recited in independent claims 11 and 20. Accordingly, claims 11 and 20, as well as dependent claims 12-19, are allowable over Brey. Applicants respectfully request withdrawal of the anticipation rejection of claims 11-20.

CONCLUSION

In light of the foregoing, Applicants respectfully submit that all pending claims 11 through 20 are in condition for allowance.

Respectfully submitted,

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